3.5.2.2.4 Proximity of Surface Water Features to Proposed ISR Facilities

Beaver Creek is the primary surface water resource in the permit area. Pass Creek is a secondary surface water resource in the permit area, since it is dry except during infrequent runoff or snowmelt events. The remaining surface water resources in the permit area are small, ephemeral stream channels and small impoundments.

3.5.3.1 Stream Sampling

As part of the baseline monitoring program stream sampling sites were established on Beaver Creek, Pass Creek, the Cheyenne River, Bennett Canyon, and unnamed tributaries. The baseline monitoring program included monthly visits to each site. Grab samples were collected from the sites on Beaver Creek and the Cheyenne River, when available, while automated samplers were installed at the sites on Pass Creek, Bennett Canyon and an unnamed tributary south of the permit area. Figure 3.5-12 shows the location of the baseline stream and impoundment sampling sites except for CHR05 and BEN01, which are not within the scale of Figure 3.5-12. These sites are shown on Plate 5.5-1. Table 3.5-11 describes which stream sites were sampled during each sampling event and provides a reason why samples could not be collected at some locations.

Section 5.3.9 describes the construction of ISR facilities in relation to surface water features. Where possible, facilities will be located out of the 100-year flood inundation boundaries. Facilities which must be located within such boundaries will be protected from flood damage by the use of straw bales, collector ditches, and/or berms.

5.3.9 Water Management and Erosion Control Pursuant to ARSD 74:28:02:11, a sediment control plan will be implemented during and after ISR operations to reduce soil loss within the permit area. Ditches, diversions, sediment traps/ponds, culverts, and other best management practices (BMPs) will be used to control surface water flow within the permit boundary. Plates 5.3-6 through 5.3-8 show the plan for water control. See Appendix 5.3-B for details on diversions in and around the facility areas.

5.3.9.1 Diversion Channels

5.3.9.2 Erosion Control

5.3.9.3 Sediment Control Plan

5.5.3 Operational Surface Water Monitoring Program

During ISR operations, 24 impoundments and 10 stream sampling sites, depicted on Plate 5.5-1, will be monitored as part of the operational monitoring program. Impoundments within and surrounding the permit area were evaluated based on location in relation to ISR operations (i.e., downgradient of proposed well fields, CPP, etc.). Table 5.5-2 lists all of the impoundments identified during the baseline surveys. The table lists all of the impoundments and identifies which impoundments are located downgradient (i.e., potentially subject to surface runoff) from ISR operations. The table also denotes the 24 impoundments included in the operational monitoring program and provides justification for impoundments not included. All 24 impoundments identified for operational monitoring will be visited on a quarterly basis throughout construction and operation. In addition, Powertech (USA) will visit all 24 of the impoundments included in the operational monitoring program four times (including pre-operational samples already collected) prior to operations to satisfy NRC pre-operational monitoring requirements. Water samples will be collected, when available, and analyzed for constituents listed in Table 6.2-1.

The previous stream sampling sites described in Section 3.5.3.1 were evaluated against NRC regulatory guidance (NRC, 1980a) to establish an operational monitoring program. Four sites (BVC01, BVC04, PSC01, and PSC02) used for baseline monitoring will be replac ed with operational monitoring sites that better meet NRC guidance as follows:

• BVC11 will be located where Beaver Creek exits the permit area. This monitoring location will replace BVC01, which was approximately 2 stream miles farther downstream, below the confluence with Pass Creek.

• BVC14 will be located where Beaver Creek enters the permit area. This monitoring

location will replace BVC04, which was approximately 12 stream miles upstream from the permit area.

• PSC11 will be located where Pass Creek exits the permit area. This monitoring location will replace PSC01, which was approximately 2 stream miles upstream from the PSC11 location, within the permit area.

• PSC12 will be located where Pass Creek enters the permit area. This monitoring location will replace PSC02, which was about 2 stream miles upstream from the permit area

A total of 10 stream sampling sites will be included in the operational monitoring program. In addition to the four new sites described above, Powertech (USA) will establish two additionalsites on unnamed tributaries in the southeast portion of the permit area. Details for each of the operational stream sampling sites are provided in Table 5.5-3.